

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see from PCT/ISA/210 (page 2)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/DE2005/001955

International filing date (day/month/year)
9/3/2004

Priority date (day/month/year)
9/29/2003

International Patent Classification (IPC) or both national classification and IPC
G01R31/00

Applicant

ROBERT BOSCH GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Name and mailing address of the ISA/
European Patent Office Rijswijk

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/001955

Box No. I Basis of this opinion

IAP5 Rec'd PCT/PTO 29 MAR 2006

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/DE2005/001955

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	_____	YES
	Claims	1-10	NO
Inventive step (IS)	Claims	_____	YES
	Claims	1-10	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims	_____	NO

2. Citations and explanations:

see supplementary page

WRITTEN OPINION

International File No.

OF THE INTERNATIONAL

SEARCHING AUTHORITY (SUPPLEMENTARY SHEET)

PCT/DE2004/001955

1) Reference is made to the following documents:

- D1: A. Vadim: Modellbasierte Implementierung eingebetteter SW-Systeme (Model-Based Implementation of Embedded SW Systems), ASCET-SD, Technical University of Munich, School of Computer Science, Primary Seminar, Summer Semester 2003.
- D2: US A 2003/0132964 (Santori et al), July 17, 2003.
- D3: Hartmut Geyer: "Durchgängiger modellbasierter Entwurf von eingebetteten Systemen am Beispiel einer Antischlupfregelung" (Integrated Model-Based Design of Embedded Systems Based on the Example of a Traction Controller), Dissertation, Technical University of Ilmenau, School of Computer Science and Automation, Institute of Theoretical and Technical Computer Science, Department of Computer Architectures, 2002.
- D4: Sven Rebeschies: "MICROS-Microcontroller-Based Real-Time Controller Toolbox for use with Matlab/Simulink", Proceedings of the 1999 IEEE International Symposium on Computer-Aided Controller Design, Kohala Coast Island of Hawaii, USA,, August 22-27, 1999.

2) Note

2.1) Claim 1

The applicant should note that the term "for" (see Claim 1, "system **for** testing...") is evaluated only in the sense of "suitable for...". It is thus prejudicial to novelty if a known

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device is indeed suitable for the specified use even if it has never been previously described for this purpose.

3) Clarity

3.1) Claims 1, 8

3.1.1) The term "experiment software" used in Claims 1 and 8 is vague and unclear and leaves the reader uncertain as to the meaning of the referenced technical feature. The term "experiment software" may be interpreted as an incomplete software version to which changes are still to be made, or as software that allows experiments for testing the control processes in a vehicle to be carried out when using the simulation model.

Consequently, the definition of the object of these claims is unclear (Article 6 PCT).

For further review, the term "experiment software" is understood to be software that enables experiments for testing the control processes in a vehicle to be carried out when using the simulation model.

3.1.2) The term "intervention point" used in Claims 1 and 8 is vague and unclear and leaves the reader unclear as to the meaning of the referenced technical feature. The term "intervention point" means that intervention, which could take any form, is performed at this point. In particular, it is unclear whether this intervention is performed by monitoring the signal, or whether a signal can, but does not have to be, changed, or whether a signal must inevitably be changed. It is further noted that an intervention of this type would be possible even by simply disconnecting the connecting lines.

Consequently, the definition of the subject of these claims is unclear (Article 6 PCT).

For further review, it is assumed that the monitoring or naming of a point in the signal pattern constitutes an "intervention point."

4) Novelty

4.1) Claim 1

4.1.1) Document D1 discloses a system for testing control processes (see page 3, line 3, "ASCET-SD") in a vehicle (see page 2, lines 20-21, "...for use in automotive engineering..."), including a simulation model which responds to the control processes to be tested (see page 3, lines 8-10, "simulation in real-time" and "integration of hardware"), experiment software being superimposed upon the simulation model (see Figure 1, the software that generates, for example, the editor window and the other superimposed control functions and also manages the connection to the hardware representing the experiment software), and a signal pattern being formed between the experiment software and a component triggering the control processes (see Figure 4 "send_message" and "receive_message"); the signal pattern being divided by at least two intervention points (see Note 1) into at least two signals (for example first into physical signals on the connecting line and secondly into a data stream before and after transmission or receipt between the experiment software and the intervention points), and at least one identifier being provided which allows the signals to be assigned to the signal pattern (see Note 2).

Note 1: See D1, page 9, section 2.3.2, "...a transputer node and an experimental electronic control unit in a bypass experiment. For each of these nodes, a control component is ... accommodated ... communication is defined by packets containing data, which are ... sent ... or received." The electronic control unit represents a component which triggers control processes.

The term "bypass" indicates that the signals are routed via the ASCET software. The intervention points occur during the transmission and receipt of these signals. Intervention can take place at both points in the signal pattern, by logging the transmit or receive signal, either by modifying the signals through programming or, in the simplest form, by physically separating the connecting line.

Note 2: See D1, page 9, Section 2.3.2, "A log ... is used to describe the communication between different processing nodes," which implies that the intervention points (the processing nodes in this case or, more specifically: the first intervention point acts upon the transmit signal in a node, and the second intervention point acts upon the receive signal in the same node; see Note 3) must be specified (and thus provided with an identifier), since logging would otherwise be impossible, see page 10, section 2.3.3, "...signals can ... be viewed," which allows an assignment to take place that requires an identifier, see also page 10, section 2.3.4, "text fields ... which increase clarity."

Note 3: The term "intervention point" is generally understood to be a point in the signal flow. Two intervention points could thus be physically located in the same place. For example, this is the case when transmit and receive data packets are transmitted on a single line.

4.2) Similar arguments can be found in the following document:

D2: System for testing control processes in a vehicle (see para. 20), experiment software (see para. 21, "first graphical program"), simulation model (see para. 21, "...models a product being designed... control algorithm..."), the component triggering control processes (see para. 20, "...brakes..."), two intervention

points (see para. 23, "...to measure characteristics of the target device...", see also para. 24, "...intermediate devices may be connected between the target device and the physical system ... such as ... actuators which control the system and/or sensors which provide feedback to the target device," these actuators or sensors thus defining the intervention points.)

D3: See page 48, second paragraph, "...online experiment...", a regulator model (see Figure 3.8, ASCET-SD model (experiment software and simulation model)) in the vehicle (see Figure 2.2, "trip regulator") being embedded. A component triggering control processes is provided, for example, by the "front wheel sensor." The two intervention points are the nodes "en" and "sen."

D4: System **suitable for** (see note under Section 2.1 above) testing control processes in a vehicle (see D1, abstract: "hardware-in-the-loop simulations"), experiment software (see D2, page 267, column 1, paragraph 2, "Matlab"), simulation model (see Figure 8), the component triggering control processes (see Figure 8, this component being the helicopter itself), two intervention points (see Figure 8, "pitch angle" and "from helicopter measured value of the pitch angle").

4.2.1) The subject of Claim 1 is therefore not novel and does not meet the requirements of Article 33(2) PCT.

4.3) Claim 8

Claim 8 describes a method according to the system recited in Claim 1. The arguments against Claim 1 therefore likewise apply to Claim 8.

4.4) Claim 9

4.4.1) Document D1 discloses a computer program for carrying out all steps according to Claim 8 when the program is run on

a computer (see D1, Figures 1, 2, 3; also see arguments against Claim 8).

4.4.2) The subject of Claim 9 is therefore not novel and does not meet the requirements of Article 33(2) PCT.

4.5) Claim 10

4.5.1) Document D1 further discloses a computer program product having program code that is stored on a machine-readable carrier for carrying out all steps recited in Claim 8 when the program is run on a computer (see D1, Figures 1, 2, 3; also see arguments against Claim 8; since the program is run by a computer, the program must also be stored on a machine-readable carrier, e.g., RAM, ROM, hard disk).

4.5.2) The subject of Claim 10 is therefore not novel and does not meet the requirements of Article 33(2) PCT.

4.6) Dependent Claims 2 through 7 do not include any features that, in combination with the features of any claim to which they refer, meet PCT requirements with regard to novelty. The reasons for this are as follows:

4.6.1) Claim 2

- Intervention points marked by identifiers (see D1 and Notes 1 and 2; the node must be identified in the log, and there must be an indication of whether the signal concerned is the transmit or receive signal).

4.6.2) Claim 3

- Signals provided with identifiers (see D1 and Notes 1 and 2; the node must be identified in the log, and there must be an indication of whether the signal concerned is the transmit or receive signal).

4.6.3) Claim 4

- Different signal groups (see D1; page 10, lines 5 and 6; transmit data and receive data).

4.6.4) Claim 5

- Signals represented visually (see D1, section 2.3.3, "... the signals may ... be viewed").

4.6.5) Claim 6

- Indicators variable (see D1, section 2.3.2, "communication between different processing nodes," since the processing nodes can be generated, the identifiers can therefore also be varied by changing the processing nodes; also see page 10, Section 2.3.4, "...text fields... which increase clarity").

4.6.6) Claim 7

- signal which replaces a signal can be input (e.g., by separating the connecting line or reprogramming; see D1, Figure 4, "constant").

5) **Industrial applicability**

The subject of the aforementioned claims meets the requirements of Article 33(4) PCT.